Brower Timing Systems
Test Center-System
2010

User's Manual

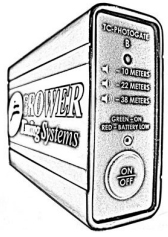
Quick Start Guide

Power On/Off

To power up the ***TC-Timer***, press and hold the ***On/Off*** button for 2 seconds. The ***Manual Start*** button will simulate a remote start, and is helpful in learning how the timer works.

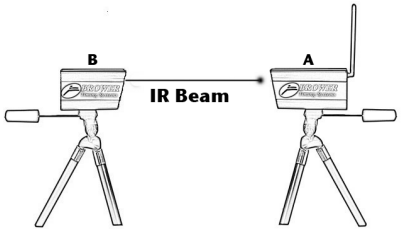
Power On PhotoGates A & B

Press and hold the ***On/Off*** button until ***TC-PhotoGate A*** beeps, then buzzes continually. For ***TC-PhotoGate B***, hold button until the desired distance is selected.



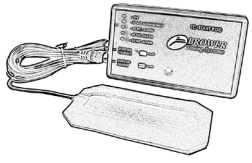
Line up PhotoGates A & B

Align ***TC-PhotoGate B*** to ***A*** until it stops beeping. Find eye center by rotating ***B*** to one side until ***A*** starts beeping then repeat to the other side. Set ***B*** in middle of these two positions.



Power on TC-Start Pod

Plug ***Touch pad*** or ***Foot wand*** into the ***TC-Start Pod***. Press and hold the ***On/Off*** button until one beep is heard.



Contents

Quick Start Guide	i
Operating Your TC-Timer	2
TC-PhotoGate Setup	5
Setting Up Your TC-Start Pod	7
TC-Start Pod Settings	8
Test Identification Number (T id)	10
TC-Timer Computer Communication	10
TC-Timer Modes	11
Split Interval Diagram	13
Troubleshooting	17
Battery Replacement	18
Caring For Your System	18
Specifications	19
Warranty	19
FCC Regulatory Compliance Information	20

Periodically check web page for updates and application information.

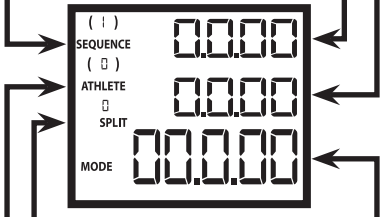
Nov 09

Operating Your TC-Timer

SEQUENCE displays the sequential order of each recorded event.

SPLIT displays the time from the start to the split.

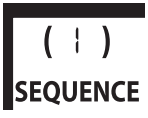
SPLIT INTERVAL displays the time from split to split.



SPLIT # displays which split time is being shown on the clock.

ATHLETE displays the athletes identifying number.

CUM displays the cumulative (total) time from the start to the finish.



Sequence

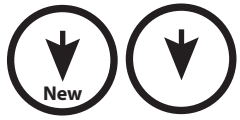
Sequence # is a chronological counter. (1 to 199) It advances when the ***New*** button is pressed, this helps the user keep track of times when using ***Memory Review***.

Power On/Off

To power up the ***TC-Timer***, press and hold the ***Power On/Off*** button for 2 seconds. The data from the last session is still in memory until memory is cleared. The clock is now ready to receive radio signals.

Memory Clear

Press and hold both buttons at the same time for approximately four seconds. Memory will clear and the clock will be reset to ***Sequence*** #1. *****All past times will be lost.*****

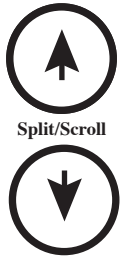


New Athlete

To start a new athlete, press the ***New*** button and a reset clock is shown. If in ***Memory Review***, use the up arrow to get to the latest sequence which will show a reset clock. (This is the only time the ***Athlete #*** can be adjusted.)

Athlete # Adjust

Athletes can be assigned an identifying number. Use ***Split/Scroll*** arrows to assign an ***Athlete #***. This may only be assigned before the clock starts for that athlete. (If in **Memory Review,** use **Up Arrow** to get to the latest sequence) After the desired number is reached, the start will lock the ***Athlete #*** to the time. If no adjustment is made for the next athlete, the same ***Athlete #*** will be assigned to the upcoming time. Press and hold the buttons to engage a high speed scroll.

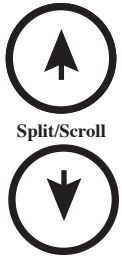


Athlete Memory Review

To review times, press the ***Memory Review*** buttons. Holding down either button will engage the high speed scroll. The sequence will adjust accordingly. The ***Athlete #*** will be displayed also.

Split Review

Press ***Split/Scroll*** buttons to review an athlete's split times. (Up to 9 splits possible) The Split counter will adjust as each split is viewed.

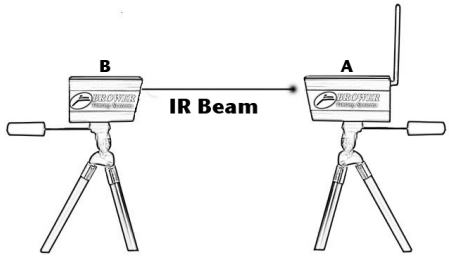


Manual Start

Press button to manually start, split or finish the timer. (Similar to a stopwatch) Using this function reduces the accuracy of an athletes time due to human error.

TC-PhotoGate Setup

- Set up the TC-PhotoGate units as displayed below at the ***START, SPLIT*** or ***FINISH*** location.
- Turn on ***TC-PhotoGate A*** by pressing and holding the power button for 2 seconds, it will beep then buzz continually, the green LED will also flash.
- Point ***TC-PhotoGate B*** in the direction of ***TC-PhotoGate A***.



- Turn on ***TC-PhotoGate B*** by holding down the ***On/Off*** button until the desired power level is selected.* The blinking green light indicates the unit is on. ***TC-PhotoGate B*** emits an infrared (IR) light beam that is detected by ***A***.
- Align ***TC-PhotoGate B*** by directing it toward the ***TC-PhotoGate A*** until it stops beeping. Center beam alignment by moving ***B*** in and out of alignment. The ***A*** unit will no longer sound when centered.
- To power down ***PhotoGates A & B***, press and hold the ***On/Off*** button for two seconds. A low tone beep will indicate power off.

*The ***TC-PhotoGate B*** has three IR power settings indicating the maximum possible distance between ***TC-PhotoGates A & B***.

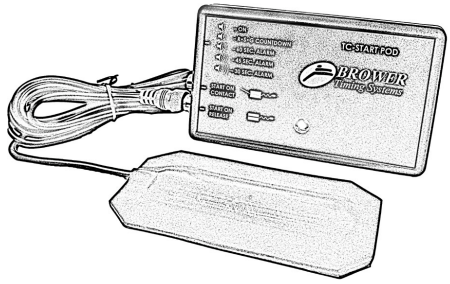
Beeps	Power	Meters	Hours of Battery Life
1 Beep	Low	10	220
2 Beeps	Medium	22	140
3 Beeps	High	38	60

Application Tip

1. For the most accurate and repeatable results, set the IR light beam at the belt height of the athletes. This will be high enough so that the legs of the athletes do not break the IR light beam. This is also low enough that swinging arms and hands of the athlete will not prematurely break the IR beam.

2. To avoid unnatural hand reaching to break the beam, set ***TC-PhotoGates A&B*** 15-30 feet apart with the running lane in the middle. Set the finish beam so it is **not** on a visible finish line. This will make it difficult for athletes to know where to reach out and break the beam with a hand, which can result in a faster time.

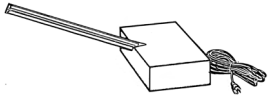
Setting Up Your TC-Start Pod



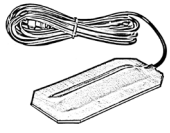
- ***Start on Release Jack:*** When plugged into this jack, the unit will beep when first touched. When pad is released, the unit will send the radio start signal to the TC-Timer

- ***Start On Contact Jack:*** When plugged into this jack, the unit will send the radio start signal and beep when the pad is first touched.

There are 3 switch devices that can be plugged into the ***TC-Start Pod***.



FOOT WAND (FW)



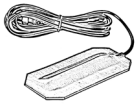
TOUCH PAD (TP)

MICROPHONE (MIC)

TC-Start Pod Settings

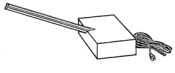
To power up the unit, press and hold the ***On/Off*** button until the desired setting is selected. (The ***TC-Start Pod*** lies on the ground.)

TC-Start Pod Settings		Start on Release Jack	Start on Contact Jack
1 Beep:	On	TP	TP, FW, MIC
2 Beeps:	Ready Set Go	TP	
3 Beeps:	60 Second Alarm		TP, FW
4 Beeps:	45 Second Alarm		TP, FW
5 Beeps:	30 Second Alarm		TP, FW



ON Setting with Touch Pad

Plug ***Touch Pad*** into ***Start On Release*** jack.
For three or four point stance starts, place the ***Touch Pad*** on the starting line using fingers to depress the center of the pad. The beep from the ***TC-Start Pod*** will confirm contact has been made. When the pad is released the time will start. The ***Touch Pad*** can also be used as a foot pad, place it under the rear foot of the athlete while the front foot is on the starting line.



ON Setting with Foot Wand

Plug ***Foot Wand*** into ***Start on Contact*** jack.
Slide red strip up so it is positioned at a 30 degree angle. Position rear foot with the toe underneath the red strip. The athletes toe should strike the strip when starting. When the red strip is struck the time will start.

ON Setting with Microphone

Plug ***MIC*** into ***Start on Contact*** jack. The microphone will trigger a transmission when any loud sudden noise is detected. The intended use for this option is with a cap gun. Hold the ***MIC*** in the same hand as the gun. Experiment with the ***MIC*** location for best results. It could also be placed in a baseball glove or taped to a bat. Experiment for best results.

Ready Set Go Setting

(R.S.G.)
Plug the ***Touch Pad*** into the ***Start on Release*** jack. In this mode the ***Start Pod*** will send out a "Ready" beep, "Set" beep and "Go" beep at random intervals. When the "Go" beep is heard, the ***Start Pod*** sends a radio start, when the athlete releases the ***Touch Pad***, the unit sends a second signal. The second signal is the athletes reaction time from "Go" beep to movement and will show as a split time.

Alarm Setting

(Used with the ***TC-Timer*** "***Count Mode***")
The alarm setting is simply a set time to perform a test. For example, how many box jumps in sixty seconds. Using this setting reduces the error of the person counting the number of jumps. Plug the ***Touch Pad*** into ***Start on Contact*** jack. When the operator touches the ***Touch Pad*** a R.S.G. start sequence begins. The finish buzzer will sound after 60, 45 or 30 seconds. The operator will use the ***Manual Start*** button on the ***TC-Timer*** to count the repetitions.

Application Tip

1. Electronic start sprint times are always slower than "start on movement hand times" this is due to the reaction time of the stopwatch operator. Studies have shown reaction times to be between 16-24 hundredths of a second. The general conversion for "start on movement hand timing" to "electronic start timing", is to subtract 20 hundredths of a second from the electronic total time.

2. A ***Foot Wand*** start will result in a slightly faster overall sprint time in comparison to the Touch Pad start. This is because the athlete has already begun his forward movement when he strikes the Wand.

TC-Timer Computer Communication

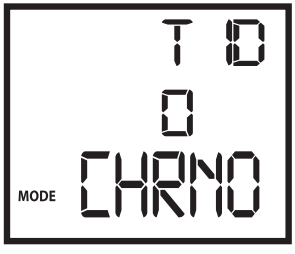
The timer is available in two forms, ***TC-Timer*** and ***TC-Timer USB***

If ***TC-Timer USB*** is purchased, it will have a computer USB port next to the antenna. This allows user to export data from the timer to a PC. To export data, Plug USB cable into the ***TC-Timer*** and connect to computer. Open ***TC-Results Center***, then press and hold the ***Download*** buttons.

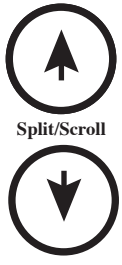
Test Identification Number (T id)

T id numbers allow the user to add a test identification number to a specific group of times. Once the identified data is downloaded to a computer, the test times can be organized and given a label, i.e. Test # 1 - 40 yard dash. For tests like the bench press or box jump, the weight or number of jumps can be entered into the ***TC-Timer***. ***T id*** numbers (0-9) are input to the ***TC-Timer*** when selecting a mode.
With the ***TC-Results Center*** software the user will be able to customize timing data on a computer into:

-Grouped test results
-Individual athlete profiles



Use buttons to enter in the test ID #.



Split/Scroll

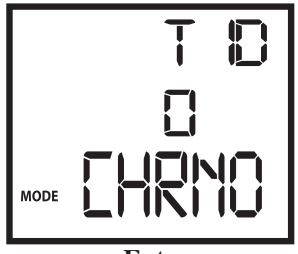
The difference between the ***TC-Timer*** and the ***TC-Timer USB*** is the ability to export data to a computer.

TC-Timer Modes

For both ***TC-Timer*** and ***TC-Timer USB***

Use the ***Mode*** button to scroll through the mode options. When on the desired mode, use the ***Split/Scroll*** arrows to enter the ***T id #***. Press ***Enter***. The ***TC-Timer*** is now setup for all ***Memory Review*** and computer options.

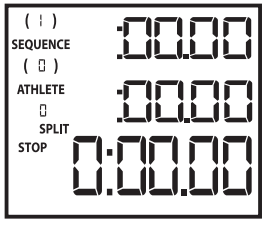
Chronograph Mode



Chrno mode is the principal mode used for the majority of timing applications. When powered on, the ***TC-Timer*** automatically enters this mode.

Description continued on pages 12, 13.

Enter

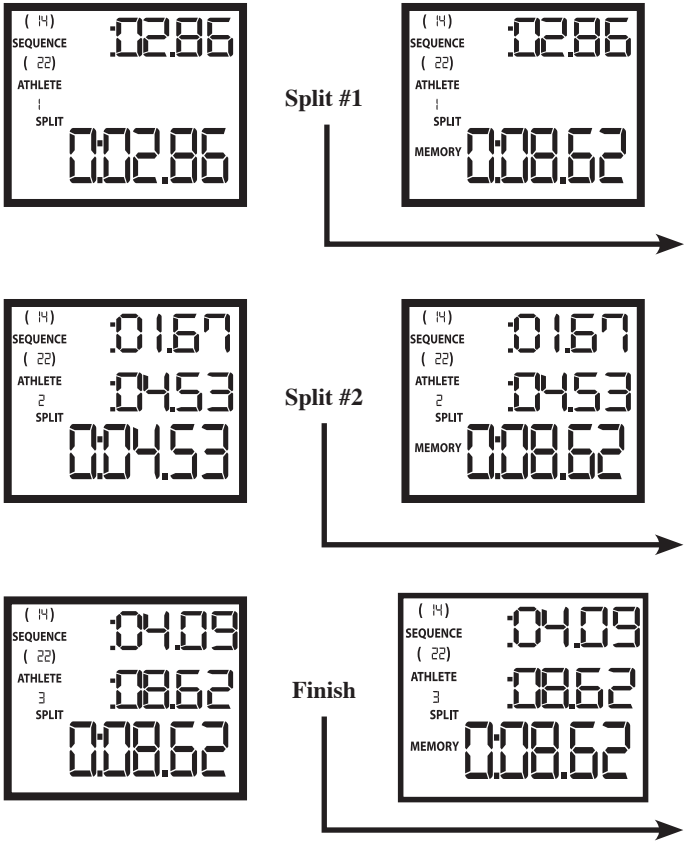


LIVE VIEW

The following examples show what the user will see during a live timing.

MEMORY REVIEW VIEW

The following examples show what the user will see in ***Memory Review***.

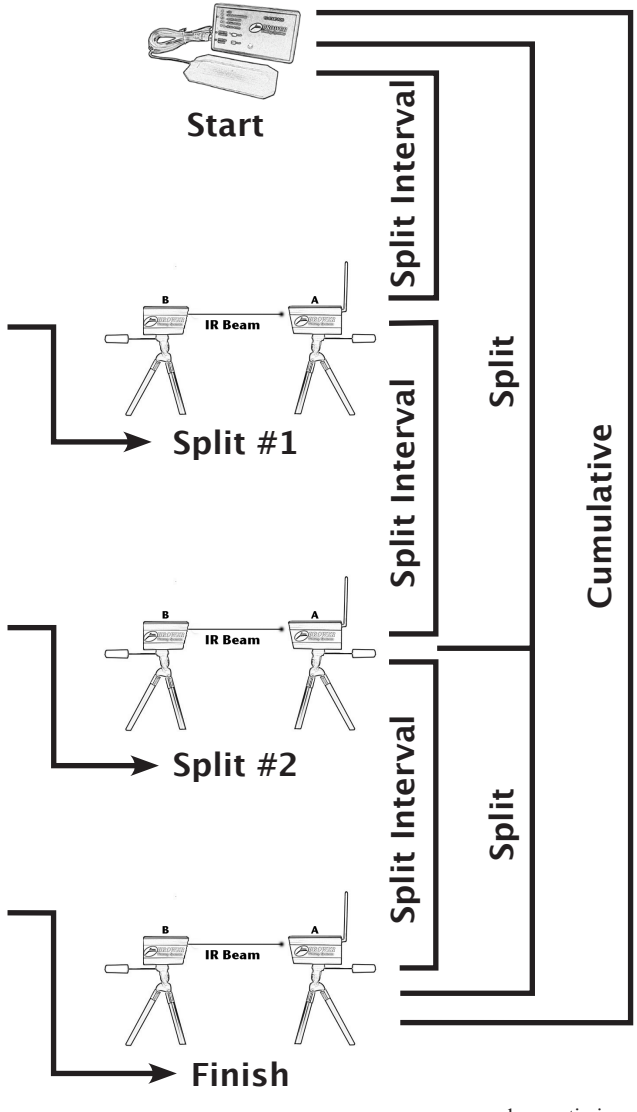


The first time the ***NEW*** button is pressed it will advance the ***SEQUENCE*** and will clear the clock.

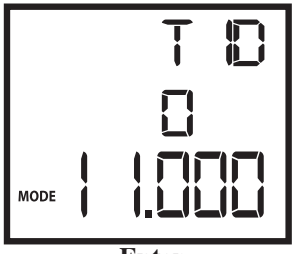
The second time the ***NEW*** button is pressed it will enter ***Memory Review***. The user is then able to navigate the Timers' memory using the ***Up*** and ***Down*** arrows. To review split times use ***Split/Scroll*** arrows.

Split Interval Diagram

The following diagram defines ***Split Interval***, ***Split*** and ***Cumulative*** times.

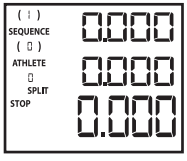


1/1000th Mode

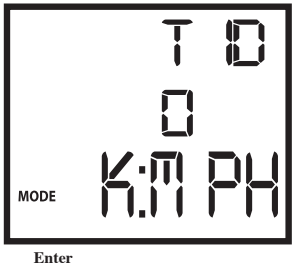


1/1000th mode is similar to the ***Chrno*** mode but displays 1/1000th of a second resolution. In this mode the display will only time to 9.999 seconds.
This mode is useful in timing short spans between the start and finish where extra resolution is needed for differentiation. All of the functions work the same as the "Chrno" mode.
Rule: You must have at least 0.12 seconds of time between start PhotoGate and finish PhotoGate.

Enter



KPH/MPH Mode



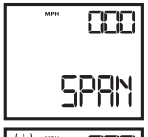
KPH/MPH mode calculates kilometers per hour and miles per hour.
Rule: You must have at least 0.12 seconds of time.

At 20 mph the span needs to be 4 feet or more. At 100 mph it is 18 feet or more.

Enter

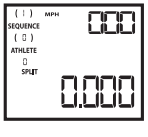
Use ***Up Split/Scroll Arrow*** to alternate between KPH and MPH.

Enter



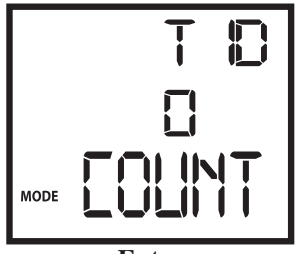
Scroll to set the number of **feet** or **meters** between the two ***Photo-Gates***.

Enter



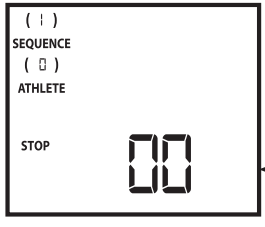
When passing through the start and finish gates, MPH will be seen on the top display and time on the bottom display. When adding a split, the ***TC-Timer*** will show MPH on the top display and advancing ***CUM*** times on the bottom display. Standard ***Memory Review*** functions will apply.

Count Mode



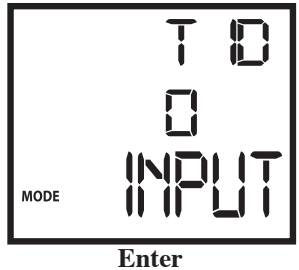
CounT mode is used with the ***Start Pod Alarm Setting***. Activate the start sequence on the ***Start Pod***. Use the ***Manual Start*** button to count the number of reps between the ***Pods*** start buzzer and stop buzzer.

Enter



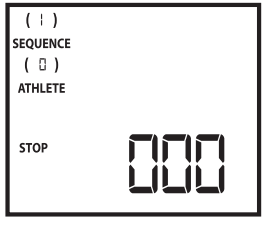
Rep Counter

Input Mode



InPuT mode is for numeric data input. Example: squat or bench press max. By manually inputting this data at the test sight, it is automatically downloaded to the computers ***TC-Results Center*** software.
(This mode is only available with the ***TC-Timer USB***)

Enter

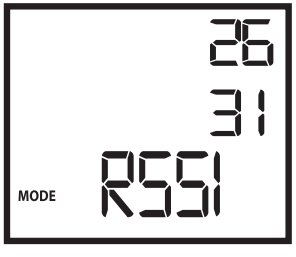


Frequency Select Mode

FREQ mode allows the user to change the radio frequency of the timing system. This allows two or more TC Systems to work in the same location. After setting the TC-Timer radio frequency (0-4), the frequency must also be changed to match in ***TC-PhotoGate A*** and ***TC-Start Pod***. This is done by removing the aluminum case, with the ***TC-Stat Pod***, remove the battery compartment door. Locate the blue switch panel and shift a lever. More than one switch cannot be down at the same time.
(All switches up is FREQ 0)

Note: A ***TC-Timer*** set to ***Freq*** 0 needs to have 5 feet of separation from a ***TC-PhotoGate*** set on ***Freq*** 1-4. Otherwise it will receive an interfering signal.

RSSI Mode



Relative Signal Strength Indicator
RSSI Test Mode allows you to self diagnose the distance capability of reception or problems with signal reception.

Problem I occasionally miss a start or stop signal.
Solution Check RSSI to see if their is radio interference at your location. Indoor interference could come from equipment i.e. machines and computers, this may be the case if your RSSI reads 30/40 or higher without your ***TC-PhotoGate A*** transmitting.

Problem I need to time distances over 1000 feet, and I want to know if I will get reliable reception.
Solution Set up your ***TC-PhotoGates*** and have someone break the beam every three seconds. Go to the desired distance, the RSSI needs to read at least 29/35.

Problem I have noise or other users on my frequency. (38/50)
Solution Try frequency 1, 2, 3 or 4. (Must also be changed in ***TC-PhotoGate A*** and ***TC-Start Pod***.)

Troubleshooting

Problem One of my timing units does not power up.

Solution 1 All units require you to press and hold the power button for at least 2 seconds to initiate the power up sequence.

Solution 2 Check the battery. The units will warn of a low battery by a red flashing LED on the ***TC-PhotoGate A*** or ***B*** and ***TC-Start Pod***. (The ***TC-Timer*** has a low battery symbol on the LCD). The units will work for up to 20 more hours and 5 for the ***TC-Timer*** with a low battery. If the unit will not turn on, check for dead battery.

Problem My timing system is setup correctly, but the ***TC-Timer*** won't receive a signal.

Solution Check to see if all the system components are on the same radio frequency. See FREQ on page 14.

Problem I occasionally miss signals.

Solution See RSSI on page 14.

Problem My tripod is broken.

Solution If a single leg is broken, order a new tripod and save the two good legs for future replacement. The legs unscrew from the tripod. (60 day warranty, $35 replacement)

Problem My touch-pad is correctly installed, but doesn't beep when I press it or beeps multiple times when I press it.

Solution Your touch-pad is worn out, order a new one. (60 day warranty, $35 replacement)

If you are still not sure the system is functioning correctly, call us at 801-572-5540

"I have found a problem, what do I do now?"
If the system has a defect go to:
http://www.browertiming.com/home_bottom_bar/return_form.htm
and complete instructions to return defective unit.

Battery Replacement

Timer: Remove the battery cover on the lower back of the unit. Install fresh AAA alkaline batteries. Replace the battery cover. Battery life: 25 hours

TC-PhotoGates A & B: Remove the set screw from the base of the unit. Apply pressure to the front of the unit between the lens and buzzer to slide the unit out of its case. Replace batteries (AAA). Place the unit back into the case and replace the set screw. Battery life: 220 hours

TC-Start Pod: Remove battery compartment door and replace with one 9V battery. Battery life: 220 hours

Caring For Your System

The TC system is water resistant but not waterproof. The general rule is if you can train in the weather conditions, the system can function. If it is raining too hard to train, take the system out of the rain. If components get wet, let them air dry before putting them back into the foam holder. If components get really wet, remove batteries until dry.

Using the Touch Pad with your feet will accelerate wear
When storing the Foot Wand, ***do not allow the red strip to severely bend***, a kink in the red strip will cause permanent damage and is not covered by warranty.

Specifications

Radio: Radio transmission distances up to 1000 feet can be received in line of sight applications. Distances can be reduced if ***TC-Timer*** is in close proximity to electric motors and computers or ***TC-Timer*** is close against a body.

Frequency: 432.8
Timing Accuracy: 1/1000 of a second.
Radio Switch Accuracy: 0.0005 of a second.

Warranty

The BROWER TIMING SYSTEM is backed by a 1 year warranty covering manufacturing defects. Service, whether covered by the warranty or not can be performed and returned quickly. (Express incoming and return shipping charges are not covered by warranty.)

Touch-pads and tripods wear out with use are only covered for 60 days by the warranty.

When returning a BROWER component, go to
http://www.browertiming.com/home_bottom_bar/return_form.htm

FCC Regulatory Compliance Information

FCC ID: XVABTS
NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his/her own expense.

CAUTION: Any changes or modification not expressly approved by Brower Timing Systems could void the user authorization to operate this equipment.

***TC-PhotoGate A* compliance labeling**
This device complies with Part 15 of the FCC Rules:
Operation is subject to the following two conditions:
1. This device may not cause harmful interference, and
2. this device may accept any interference received, including interference that many cause undesired operation.

Brower Timing Systems
12660 South Fort Street #102
Draper, Utah 84020 USA
Phone 801-572-5540 Fax 801-572-5941
techsupport@browertiming.com